UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Network and Pathway Analysis A1F

7.5 credits

Course code: SY769A
Version number: 6
Valid from: 1 January 2026
Ratified by: Curriculum Committee for Bioscience
Date of ratification: 22 May 2025

1. General information about the course

The course is provided by the University of Skövde and is named Network and Pathway Analysis A1F (Nätverks- och pathway-analys A1F). It comprises 7.5 credits and is a second-cycle course. The level of progression is A1F.

The course is a part of the main field of study in Systems Biology. It can also be a part of the main field of study in Bioinformatics. The disciplinary domain of the course is Natural Sciences.

2. Entry requirements

The course has the following entry requirements: passed BI760A Bioinformatics Concepts and Methods A1N and passed SY768A Data Analysis for Life Science A1N and attended SY765A Systems Biology A1F (or the equivalent).

An additional requirement is proof of skills in English equivalent of studies at upper secondary level in Sweden, known as English course 6 or English level 2. This is normally demonstrated by means of an internationally recognized test, e.g. IELTS or TOEFL or the equivalent.

3. Course content

The course includes network and pathway analysis that is applied on different omics data. The focus of this course is to apply different enrichment methods on large-scale data in order to understand how over-representative set of molecules in a data set can be associated with different biological networks and cell signaling pathways. The course also includes the use of databases and different ID conversions. Underlying principles for information sources, modeling methods, visualization and analysis are general and can be applied in many areas.

4. Objectives

After completed course the student should be able to:

- describe different statistical methods and algorithms used in enrichment analysis,
- apply different enrichment methods to analyze data sets in molecular biology,
- analyze, visualize and present results from data analyses related to biological networks,
- apply different methods and databases to analyze biological networks and pathways, and
- present and critically review scientific articles in network and pathway analysis.

5. Examination

The course is graded A (Excellent), B (Very good), C (Good), D (Satisfactory), E (Sufficient) or F (Fail).

A final grade of the course is only issued when all the examination parts have been passed.

The examinations of the course consist of the following modes of assessment:

- **Written examination in computer lab**
  4.5 credits, grades: A/B/C/D/E/F (determines the final grade)
- **Written assignments**
  2 credits, grades: G/U
- **Oral presentation**
  1 credit, grades: G/U

Students with a permanent disability who have been approved for directed educational support may be offered adapted modes of assessment.

6. Types of instruction and language of instruction

The teaching comprises lectures and computer labs.

The teaching is conducted in English.

7. Course literature and other educational materials

Tutorials and scientific articles

8. Student influence

Student influence in the course is ensured by means of course evaluation. The students are informed about the results of the evaluation and potential measures that have been taken or are planned, based on the course evaluation.

9. Additional information

Further information about the course, as well as national and local governing documents for higher education, is available on the website of the University of Skövde.